

Chapter 7: Processes of script adaptation and creation in Linear B: the evidence of the ‘extra’ signs*

The Linear B syllabary can be divided into two main groups of signs. Firstly, the ‘core’ (or ‘basic’) signs, each standing for either a vowel or a single consonant plus vowel: these are so-called because they are the only group of signs that is strictly necessary for writing in Linear B according to the usual spelling rules.

a	e	i	o	u
da	de	di	do	du
ja	je		jo	
ka	ke	ki	ko	ku
ma	me	mi	mo	mu
na	ne	ni	no	nu
pa	pe	pi	po	pu
qa	qe	qi	qo	
ra	re	ri	ro	ru
sa	se	si	so	su
ta	te	ti	to	tu
wa	we	wi	wo	
za	ze		zo	

Figure 7.1: The Linear B core syllabary

Secondly, the ‘extra’ (or ‘additional’) signs, which can in certain circumstances optionally replace core signs. These extra signs are usually classified according to their orthographic function: ‘doublets’ replace a single core sign to specify a more precise phonetic value (e.g. the sign *a*₂ can be used instead of *a* to specify /ha/); ‘complex signs’ replace a sequence of two core signs (e.g. /dwo/ can be spelt with two signs, *do-wo* or *du-wo*, or with the single complex sign *dwo*).¹ For the purposes of this paper, however, I prefer to divide the extra signs into groups according to their values, as shown in Figure 7.2.²

*This paper is based on part of my PhD thesis (supported by the UK Arts and Humanities Research Council, grant number AH/J500094/1; the British Federation of Women Graduates’ J. Barbara Northend Scholarship, 2015-16; and the Cambridge Faculty of Classics’ Graduate Studies Fund), which is due to be submitted to the University of Cambridge in early 2016. I would like to thank Pippa Steele for organising the VRBS conference and inviting me to participate; I am also grateful for the support of my PhD supervisor, Torsten Meißner, and for comments from all the attendees of VRBS and of the *III Diálogos Micénicos* (Universidad Autónoma de Madrid, May 2015), at which another version of this paper was presented.

¹ *ra*₂ and *ro*₂ can, due to a sound change */ry, ly/ > /rr, ll/, replace either the digraphic sequences *ri-ja* and *ri-jo* */rya, lya/, */ryo, lyo/ or the single signs *ra* and *ro* /rra, lla/, /rro, llo/ (Lejeune 1997b, 208-212); they are therefore termed ‘pseudo-complex’ signs (Duhoux 2008, 247).

² Most of the undeciphered Linear B signs must also belong to the group of extra signs, since there are few ‘gaps’ in the core syllabary, but as these signs’ values are uncertain they will not be included in this discussion. This issue will be addressed in my PhD thesis.

Aspirated vowel	a_2 /ha/				
Diphthong	a_3 /ai/	au	ra_3		
Aspirated stop	pu_2				
Labialised	dwe	dwo	nwa	twe	two
Palatalised	ra_2 */rya, lya/ > /rra, lla/	ro_2 */ryo, lyo/ > /rro, llo/	ta_2 /tya/	pte < */pye?	

Figure 7.2: The Linear B extra signs³

The ‘extra’ status of these signs is what makes them of particular interest in discussing processes of script adaptation and creation: given that they are not strictly necessary when writing Linear B, why do they exist in the first place, and why were they used by the Mycenaean scribes? This paper will, firstly, examine the ways in which the extra signs are often used as evidence for the process by which Linear A was adapted to produce Linear B, and thus, by extension, for reconstructing aspects of the Linear A script and the Minoan language;⁴ it will then explore how this group of signs can more productively be used to investigate the motivations behind the creation and use of new signs within Linear B itself.

Adaptation from Linear A to Linear B

The structures of many of the extra signs, particularly those representing consonant clusters, appear to be anomalous in the context of the Linear B script, compared to the simpler structures (vowel or consonant plus vowel) of the core signs (Figure 7.1). Many of these signs’ values appear equally unexpected in a Greek linguistic context: /nwa/, for instance, is not a sequence likely to appear very often in Greek, which does not permit /nw/ as an onset (Meißner 2013, 10) – indeed, apart from the adjective *pe-ru-si-nwa* /perusinwa/ ‘last year’s’, all the terms in which this sign appears are probably

³ I give the most commonly-accepted values for these signs, with the exception of pu_2 : I am unconvinced by the frequent assumption that this represents /bu/ as well as /pʰu/, but discussion of this is beyond the scope of this paper (see, e.g., Melena 1987, 226-230 and 2014, 71-73; Lejeune 1972a, 95-96; Thompson 2005, 111-114). ra_2 and ro_2 are generally agreed to represent */rya, lya/ and */ryo, lyo/ and the Mycenaean geminate outcomes of these sequences /rra, lla/ and /rro, llo/, but have been argued to also represent simple /la, lo/ (e.g. Heubeck 1979, 245-254); in the absence of any unambiguous examples of this, it seems better to assume the smaller range of values. ta_2 has been argued to represent /ta/ (Heubeck 1979, 254-257) or /sta/ (Melena 2014, 78-80) rather than /tya/, based on the fact that original */ty/ had already undergone palatalisation in Mycenaean; however, this sign generally represents secondary /tya/ resulting from resyllabification of /tia/, to which this sound-change would not apply (cf. the similar resyllabification process seen in */ria/ > */rya/ > /rra/, etc.: Lejeune 1997b, 211-212). On *pte*, see pp.●●.

⁴ For the purposes of this chapter, ‘Minoan’ refers to the language of the Linear A texts (which are most probably all written in the same language: Duhoux 1978, 103-105 and 1989, 92; Davis 2014, 179-181). Other non-Greek languages (whether related to the ‘Minoan’ of the Linear A inscriptions or not) may well, of course, have existed on Crete during this period: Cretan Hieroglyphic, for instance, is often assumed (though not proven) to represent a different language from Linear A (see, e.g., Olivier 1997, 50; Duhoux 1998, 24-26).

of non-Greek origin.⁵ It is frequently assumed that such ‘odd-looking’ features of Linear B must be inherited from Linear A, and, moreover, that such reconstructed Linear A features directly reflect aspects of the Minoan language, enabling a partial reconstruction of Minoan phonology. This assumption applies equally to other features of Linear B which appear ill-suited to representing Greek phonology, such as the lack of distinction between /r/ and /l/ or between voiced, voiceless, and aspirated stops (see, e.g., Lejeune 1958a, 327-328; Packard 1974, 115; Davis 2014, 193-204), but in the context of the extra signs is particularly relevant to the palatalised and labialised signs.⁶ These have usually been seen as evidence for a phonemic opposition in Minoan between palatalised, labialised, and plain consonants – a hypothesis first put forward by Palmer (1955, 38 and 1963, 38-40), which has often recurred since: for instance, Beekes (2010, xvi-xvii) proposes an essentially identical reconstruction of ‘Pre-Greek’ phonology (see also Beekes 2014, 4). Stephens and Justeson (1978) and Davis (2014, 193-195 and 236-239) add a further argument, based on the typological ‘universal’ that writing systems rarely introduce innovations to represent highly-marked sounds if less highly-marked sounds are not already represented: signs representing highly-marked labialised and palatalised stops should not, therefore, have been invented within Linear B, since the script does not systematically represent the less highly-marked Greek phonemic features of aspiration and voice. However, the latter fact is usually accounted for by assuming that aspiration and voicing were non-phonemic in Minoan, so the universal would not be violated if these signs were inherited from Linear A. Thus, out of two (potentially much larger) series of Linear A signs representing Minoan labialised and palatalised consonants, those representing phonemes similar to /d^w/, /t^w/, /n^w/, /r^y/, /t^y/, and perhaps /p^y/ would underlie the Linear B complex signs.⁷ In the process of adapting Linear A to write Greek (a language with almost no phonemic labialisation or palatalisation) these signs, originally representing a single consonant plus vowel, would have been reinterpreted as representing consonant clusters (/dw/, /tw/, etc.), giving rise to their apparently anomalous Linear B structures and values. The exception, of course, would be the labiovelars, which were still generally preserved in Mycenaean Greek;⁸ the Linear B *q*-series, representing /k^w/, /k^{wh}/ and /g^w/, would thus be a straightforward continuation of a Linear A series representing labialised velars (*vel sim.*).

⁵ All phonetic interpretations and translations of Mycenaean terms are based on *DMic* and Bartoněk 2003 unless otherwise stated.

⁶ Other extra signs have also been used in reconstructions of Minoan, most notably *pu*₂ – see, e.g., Melena 1987 and Davis 2014, 214-220. For reasons of space, however, this discussion will be restricted to the palatalised and labialised signs, whose impact on the proposed phonological structure of Minoan has been greater.

⁷ The exact phonetic values of such Minoan phonemes may of course have differed from the corresponding Mycenaean Greek consonants; on the reconstruction of Linear A values from Linear B, see Steele and Meißner, this volume.

⁸ In all environments except adjacent to /u/: e.g. *qo-u-ko-ro* /g^woukolos/ ‘cowherd’ < */g^wou-k^wol-os/ (~ βουκόλος) retains the initial but not the medial labiovelar.

Difficulties with this hypothesis arise, however, when the actual palaeographic data is considered, since relatively few of these Linear B signs have known correspondences in Linear A (or Cretan Hieroglyphic):

Linear B	Linear A	Cretan Hieroglyphic
<i>ra</i> ₂	AB76	069
<i>ro</i> ₂	–	–
<i>ta</i> ₂	AB66	–
<i>pte</i>	–	–
<i>dwe</i>	–	–
<i>dwo</i>	–	–
<i>twe</i>	AB87?	–
<i>two</i>	–	–
<i>nwa</i>	AB48	006
<i>qa</i>	AB16	–
<i>qe</i>	AB78	074/075
<i>qi</i>	AB21	–
<i>qo</i>	–	–

Figure 7.3: Correspondences of labialised and palatalised signs in the Cretan scripts⁹

Thus, only two palatalised signs, the majority of the *q*-series, and *nwa* are certainly inherited. Of course, the absence from Linear A and/or Cretan Hieroglyphic of an attested correspondence for a given sign could always be due to chance;¹⁰ the fact that a relatively high proportion of Linear B signs in *-o* have no known antecedents in the other Cretan scripts makes the lack of correspondences for *qo* and *ro*₂ unproblematic for this hypothesis,¹¹ whether this situation is due to an actual lack of *o*-series signs in Linear A (in which case *qo* and *ro*₂ would be Linear B creations, based on the existing *q*-series and *ra*₂) or merely to chances of attestation.¹² The implications of *pte*'s lack of any known

⁹ Based on *GORILA*⁵, xxii and *CHIC*, 19. Other possible, but not widely accepted, correspondences will be discussed where relevant below.

¹⁰ Cf. the relatively recent discovery of the single known attestation of AB48 (SY Za 4: Muhly and Olivier 2008, 207-208 and 216) – although *nwa*'s Cretan Hieroglyphic equivalent, 006, was already well-attested.

¹¹ Note that Younger (2003, 10) suggests a possible correspondence for *ro*₂ with Cretan Hieroglyphic 040 ; however, this is much more likely to correspond to AB86 (*86 (*CHIC*, 19).

¹² The absence of known Linear A counterparts to many of the *o*-series has often led to the assumption that Linear A lacked an *o*-series, and that this indicates an absence of this vowel from the Minoan language; this has usually formed part of an argument for a three-vowel system in Minoan, since there are also some Linear B *e*-series signs without Linear

correspondence will be discussed below (pp.●●). However, for most of the labialised signs, there is some positive evidence to suggest a Linear B creation, beyond simply the lack of any known correspondences.

two

This is found only on PY An 261.2-.5 (Hand 43) in the personal name *o-two-we-o* (/Orthwōwēhos/, genitive of /Orthwōwēs/?). This name is spelt differently by other Pylos hands (genitive *o-to-wo-<we->o*, Un 616 v.4 and An 261 v.7, Hand 1; nominative *o-tu-wo-we*, Jn 658.7, Hand 21, and Jn 725.5, Hand 2; dative *o-to-wo-we-i*, Vn 851.9, Hand 12)¹³ suggesting that this sign may well have been idiosyncratic to Hand 43 – perhaps even invented in the process of compiling this tablet, in order to write this repeated name more efficiently.

twe


This is found only in the KN So-series in the neuter plural adjective *o-da-twe-ta* (/odat-wenta/ ‘fitted with teeth’, describing chariot wheels),¹⁴ with five examples in Hand 130 (So(1) 4430.b, 4432, 4436.1, 4440.b, 4441) plus one or two unattributed examples (*o-]da-twe-ta*], So 8561; *]twe-te*, dual /odat-wente/?), So 8251.a). AB87  is a possible correspondence (*GORILA*⁵, xxii); however, this Linear A sign is not an exact formal match and moreover is currently attested only as an ideogram (on a single tablet, HT 126.b2-3).



Figure 7.4: *twe*¹⁵



Figure 7.5: AB87¹⁶

A correspondences (e.g. Packard 1974, 112-114; Palaima and Sikkenga 1999, 603-604). However, other explanations have also been put forward, such as that Minoan had *more* than five vowels (Duhoux 1989, 72-73) or that *e*- and *o*-vowels were secondary developments from an original three-vowel system (Davis 2014, 240-241). Most recently, Meißner and Steele (forthcoming) argue persuasively that this situation is most likely to be due to chances of attestation, especially given the relative rarity of the *o*-series' attested Linear A correspondences.

¹³ The majority of these probably refer to the same individual (Nakassis 2013, 329-330).

¹⁴ This term is spelt differently by various other scribes: *o-da-tu-we-ta* (KN So 894, -), *o-da-ku-we-ta* (So 4435.B, Hand 128?; L 870, Hand 114?), and *o-da-ke-we-ta* (So(2) 4446.1, Hand 131; Sg 1811.5.6, -). /odat-wenta/ is the original form, from zero-grade */odnt-/ ‘tooth’ (cf. *o*-grade ὀδούς, ὀδόντος); the alternative form /odak-wenta/ may have arisen through dissimilation (Lejeune 1997a:30-1) and/or reanalysis by comparison with the phonetically and semantically similar root */dak-/, cf. δάκνω ‘bite’ (T. Meißner, pers. comm.). Although strictly speaking it is therefore possible that *twe* in fact represents /kwe/, the balance of probability is in favour of /twe/: it seems most likely, though not entirely certain, that any scribe wanting to spell /kw/ with a single sign would have used the *q*-series (Melena 2014, 40-41).

¹⁵ KN So(1) 4430.b (after *COMIK*²).

¹⁶ HT 126.b2-3 (after *GORILA*¹).

While a correspondence between *twe* and AB87 cannot be entirely ruled out, it is thus far from certain, and as both signs have a relatively simple form, an independent development of *twe* is certainly possible. The latter's distribution leads me to regard it as more plausibly a Linear B invention, perhaps by Hand 130 themselves, in a similar manner to *two*.¹⁷

dwo



This sign (found at Knossos, Pylos, and Thebes) has been argued to correspond to AB118 , the Linear A syllabogram and metrogram which gave rise to the Linear B metrogram L  (Consani 1996; Davis 2014, 195, n.1128): *dwo* would therefore represent the continuation of the syllabic use of AB118. This is, however, palaeographically implausible: L and *dwo* are quite clearly distinct signs in Linear B, and there are no other examples of a single inherited sign diverging to this extent in Linear B; moreover, the form of *dwo* is significantly different from that of AB118.



Figure 7.6: AB118¹⁸

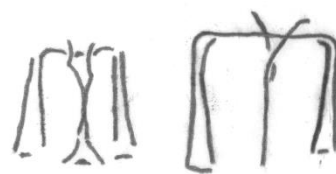




Figure 7.7: L¹⁹



Figure 7.8: *dwo*²⁰

The more widely-accepted view that *dwo* was created within Linear B from mirror-image forms of the sign  *wo* is far more probable. This is shown to have taken place in a Greek linguistic context from the fact that two examples of *wo* (which also has no known Linear A antecedent) have

¹⁷ Melena (2014, 62, n.73) mentions A305  as another possible Linear A correspondence, if reversed. Reversed sign-forms do occur in Linear A, and A305 is attested as a syllabogram as well as an ideogram; however, lacking any attestations in the same orientation as *twe*, the same arguments apply to this as to AB87.


¹⁸ HT 13.5, KN 2.2, KN Za 19.2 (after *GORILA*⁵).

¹⁹ KN Oa 730 (after *COMIK*¹); PY Ja 749 (after a photograph in the Mycenaean Epigraphy Room collection, Faculty of Classics, Cambridge). Not to scale.

²⁰ KN Fh 360.b (after *COMIK*¹); PY Ep 539.12 (after a photograph in the Mycenaean Epigraphy Room collection, Faculty of Classics, Cambridge). Not to scale.

been combined to give the sign *dwo*, homophonous with /dwo/ ‘two’ (Lejeune 1958b, 261-262, n.23; see also Meißner and Steele [forthcoming]).

dwe

This sign (found at Knossos, Pylos, and Thebes) is primarily attested in the term *te-mi-dwe* /termid-wents/ ‘provided with endings’,²¹ and most plausibly a Linear B creation by analogy with *dwo*. The sign’s ‘arms’ consist of mirror-image forms of the sign *we* ,²² and it is also possible that the body of the sign was formed in the same way but subsequently simplified (Meißner 2013, 10).

The likelihood is, therefore, that the majority of labialised and some palatalised signs were newly created within Linear B. This appears to be at odds with the typological argument cited above (p.●●); however, while signs like AB48/*nwa* and AB66/*ta*₂ may have represented single labialised and palatalised phonemes similar to /n^w/ and /t^y/ in Linear A, in Linear B they and the other complex signs represent *sequences* of two phonemes. The primary motivation for their use is, therefore, not phonemic representation *per se*, but efficiency in writing certain combinations of phonemes – so a typological universal relating to the representation of single phonological features simply does not apply to this particular situation.²³

It is still likely that Linear A had some signs representing palatalised and labialised consonants, but the evidence of *ra*₂ (and perhaps *ro*₂?), *ta*₂, *nwa*, and the *q*-series seems insufficient to support the reconstruction of a more systematic distinction of labialisation and palatalisation in Linear A and the Minoan language.²⁴ As Davis (2014, 239) admits, it is not even entirely certain whether these Linear A signs may have represented not single phonemes but sequences of two consonants, as they mostly do in Linear B. Moreover, three of these signs have attested Cretan

²¹ This term is the alternative to *o-da-twe-ta* in descriptions of chariot wheels. *te-mi-dwe* (KN So 894.1) is the nominative singular: it is also attested in the dual *te-mi-dwe-te* /termid-wente/ (KN So(1) 4437, So(2) 4433.a) and most commonly in the plural *te-mi-dwe-ta* /termid-wenta/ (PY Sa 791 and 793; KN So-series). *te-mi-we-te* (KN Sg 1811.3) may be another alternative spelling.

²² This is the most common form of the sign, found in most examples from Knossos (Hands 103, 130, 131, and 135) and the single example from Thebes (TH Wu 99.β). Pylos Hand 26 and the scribe of KN So 894.1.3 use a form with straight horizontal ‘arms’, but this is plausibly a simplified form.

²³ The only exception to this is the *q*-series, representing /k^w/ etc. – most of which were indeed inherited from Linear A, as the universal predicts.

²⁴ Cf. Meißner (2013, 10). The Linear B *z*-series (*za*, *ze*, and *zo*: all inherited from Linear A) have sometimes been argued to represent palatalised velars /k^y, g^y/ (e.g. Petruševski 1979; Risch 1979), but it seems more likely that at the period of the Linear B tablets, at least, these represented affricates (*Docs*², 389; Morpurgo Davies 1985, 79-80 and 105-106; Melena 2014, 53). Possible labialised or palatalised values for undeciphered signs are also frequently cited in support of this reconstruction – e.g. *64 and *82 are often viewed as *swi* and *swa* (e.g. Chadwick 1968, 63-65) or *twi* and *twa* (Melena 1983, 263-266 and forthcoming, 35-36 and 45); for further examples see Melena (2014, 54). However, such decipherment proposals are still uncertain, and not universally accepted; they are, moreover, often founded on the assumption that Linear A and Minoan had whole series of labialised and palatalised consonants and so further such signs ought to exist in Linear B. Using such proposals as evidence for Minoan labialisation and palatalisation is, therefore, both insecure and circular.

Hieroglyphic equivalents – which, given that the linguistic relationship between Cretan Hieroglyphic and Linear A is still unclear,²⁵ makes the question of how far their values reflect aspects of Minoan phonology even more problematic.

In fact, this group of signs is much *less* useful for analysing the processes of adaptation which took place in the formation of Linear B from Linear A, and hence for reconstructing Minoan phonology, than has often been claimed. What it does do is raise an important methodological point, namely that it cannot simply be assumed that any structurally or linguistically unexpected feature of the Linear B script must go back to Linear A, let alone that any such reconstructed feature of Linear A must necessarily be a direct reflection of the Minoan language – and this applies to other assumed Minoan phonological features, such as the lack of distinction between voiced, voiceless, and aspirated stops, or between /r/ and /l/, just as much as to labialisation and palatalisation. This is not to claim that Minoan certainly did not or could not have possessed any or all of these features, only that in attempting to reconstruct Minoan phonology, as in any other discussion of the relationship between Linear A and Linear B, it is just as necessary to examine individual signs in detail as it is to analyse the overall structure of each script – since, as is shown by the labialised and palatalised signs, even signs with similar values may not have been created in the same way or for the same purpose(s). The second half of this paper, therefore, aims to demonstrate the potential wider implications of studying individual signs in this way. I will focus on the extra signs which appear to be new creations, rather than inherited from Linear A, in order to explore the motivations behind their use and the processes of sign creation which took place within the Linear B script.

Creation of new signs within Linear B

Nine of the extra signs – *a*₂, *a*₃, *ra*₃, *dwe*, *dwo*, *twe*, *two*, *ro*₂, and *pte* – have no certain or probable correspondences in the other Cretan scripts, and we have already seen that there is good evidence for thinking that at least some of these were Linear B creations. The question to be asked, therefore, is why those creations took place – what was the purpose (or purposes) for which these signs were invented?

Examining the corpora of attestations of these nine signs, there are some which immediately appear to have a grammatical or morphological motivation for their use. *a*₂ 𐀀 (/ha/), for instance, is used in c.25% of its occurrences to denote the nominative/accusative plural ending of neuter *s*-stem

²⁵ As remarked above (p.●●, n.4), it is often assumed (though by no means certain) that the co-existence of Cretan Hieroglyphic and Linear A was because they represented different languages. In addition, it is more likely that both descend from a common ancestor than that Linear A is a direct descendant of Cretan Hieroglyphic (Olivier 1997, 50-51); what language(s) this hypothetical ancestral script would have been used to write is of course unknown.

nouns and adjectives (e.g. *pa-we-a₂* /p^harweha/ ‘cloths’, *me-zo-a₂* /meizoha/ ‘larger’). In principle such neuter plural endings could equally be spelt with the core sign *-a*, since the marking of aspiration is optional according to the general Linear B spelling rules; in fact, the spelling with *-a₂* is arguably over-marked in phonetic terms, since the lack of a glide being indicated between two non-diphthong-forming vowels would by default represent a hiatus, and could thus function as a means of expressing intervocalic /h/.²⁶ However, spellings of *s*-stem neuter plurals in *-a* are found almost exclusively at Knossos: there are no more than three examples on the mainland,²⁷ compared to c.40 in *-a₂*,²⁸ demonstrating an overwhelming preference for the more highly-marked spelling in *-a₂* (which is thus very far from being the ‘sporadic procedure’ described by Melena [2014, 77]). The different situation at Knossos – where spellings in *-a* are by far the more common²⁹ – is likely to be due to linguistic factors, namely the loss of /h/, which seems to have been further advanced at Knossos than at the mainland sites (Meißner 2008, 513). With the exception of texts from the Room of the Chariot Tablets (which may be significantly older than the other Knossos tablets: Driessen 1990 and 2000), the only two terms in which *a₂* certainly appears at this site are *e-ma-a₂* /Hermāhas/ ‘Hermes’³⁰ – which, as a theonym, is perhaps particularly likely to retain a conservative pronunciation and/or spelling – and the neuter plural *pa-we-a₂*, used by Hand 114.³¹ The fact that this one scribe, at least, uses this conservative spelling for an *s*-stem neuter plural suggests that even in a context where /h/ may have been largely or entirely lost, non-linguistic factors may have similarly encouraged this retention of the more highly-marked spelling, parallel to the clear preference seen on the mainland.

A similar situation can be observed regarding *ra₃* 𐀢𐀶 (/rai, lai/), which is attested as a syllabogram only at Pylos (it appears at Knossos as the ideogram CROC ‘saffron’).³² This sign

²⁶ Cf. the regular use of spellings without a glide following *-i* and *-u* to indicate /h/ (Meißner 2008, 515).

²⁷ *tu-we-a* /t^huweha/ ‘aromatic substances’ (PY Un 267.3); *we-]je-ke-a*, probably = *we-je-ke-a₂*, an obscure neuter plural adjective (PY Wa 1148.2); *]ko-wo-a*, probably a perfect participle ending (IK X 1: Shelmerdine 2012, 75-76).

²⁸ *a-ke-a₂* /aggeha/ ‘jars’ (PY Vn 130.2b); *ke-re-a₂* /skeleha/ ‘legs’ (PY Ta 641.1a); *no-pe-re-a₂* /nōp^heleha/ ‘unusable’, *te-tu-ko-wo-a₂* /tetuk^hwoha/ ‘finished’, *we-je-ke-a₂*, obscure, see n.27 (PY Sa-series); *me-u-jo-a₂* /meiw(i)yoha/ ‘less’, *me-zo-a₂* /meizoha/ ‘larger’ (PY Sh-series); *qe-te-a₂* /k^weiteha/ ‘to be paid’ (PY Un 138.1; TH Wu 51.γ, 65.γ, 96.γ); *pa-we-a₂* /p^harweha/ ‘cloths’ (MY L 710.2, Oe 127); *tu-we-a₂* = *tu-we-a* (HV X 4.2: Aravantinos and Vasilogamvrou 2012, 53). Perhaps also *ru-de-a₂*, obscure, feminine nominative singular or neuter plural (PY Un 853.11) and *]we-e-a₂* = *we-we-e-a*? see n.29 (PY Ub 1318.3).

²⁹ Up to c.50 examples: *a-ra-ru-wo-a* /ararwoha/ ‘fitted (with), assembled’ (Ra(1)-series); *a-te-re-te-a*, obscure (So 894.1); *e-ke-a* /egk^heha/ ‘spears’ (R 1815); *o-re-ne-a* /ōleneha/ ‘with short sleeves’? (L(2) 593.Ab); *pa-we-a* = *pa-we-a₂* (Lc-, Ld(1)-, and L-series); *qe-te-a* = *qe-te-a₂* (Fp(2) 363.1); *te-tu-ko-wo-a* = *te-tu-ko-wo-a₂* (L 871.b); *we-we-e-a* /werwereha/ ‘made of wool’ (L 178, 870).

³⁰ *e-ma-a₂* [(X 9669.b); *e-ma-a₂-o* /Hermāhāho/, genitive (D 411).

³¹ KN Ld(2) 787.B; on 786.B and 788.B only *a₂* is preserved, but the restoration *pa-we-]a₂* seems secure from context.

³² CHIC, 19 equates this sign with Cretan Hieroglyphic 023/159bis 𐀢, which acts as a syllabogram as well as a logogram. However, it is unclear which plant 023 represents; I follow Younger (Cretan Hieroglyphic website, section ‘Notes on the Signs’) in regarding AB122 = OLIV 𐀢 as a more likely formal correspondence.

appears in *a*-stem nominative plural nouns and adjectives in c.50% of its occurrences.³³ The dative singular ending of *a*-stem terms like these would be /-r-āi/ (or /-l-āi/) – homophonous with the nominative plural ending except for the vowel length, which is never distinguished in Linear B. Thus, *ra*₃ might also be expected to appear in such dative singular forms; that there are no attested examples of this could be ascribed to chance, but there are at least four probable examples of dative singulars in /-r-āi/ or /-l-āi/ written as *-ra* by scribes who have used *ra*₃ in nominative plurals.³⁴ This may suggest a deliberate choice regarding the use of the more highly-marked spelling with the extra sign, restricting it to just one of the two case-endings it could theoretically represent.³⁵

Of course, these grammatical uses are far from being the sole possible reason for using or creating these signs: *a*₂ is found in a wide variety of Greek and non-Greek personal names, place names, and other terms in addition to neuter plural endings, and the creation of a sign for /ha/ may have also been partly due to the high frequency of /a/ in Greek (and in particular of both /a-/ and /ha-/ word-initially).³⁶ *ra*₃ likewise appears in other contexts, including some personal names and appellatives, but most notably the noun *e-ra*₃-wo /elaiwōn/ ‘olive oil’ (six times in the PY Fr-series) and *pe-ra*₃-ko-ra-i-ja /Per(ā)-aigalaia/,³⁷ the ‘Further Province’ – thus, *ra*₃ can also be seen to have a lexical function in enabling the more efficient representation of two important terms at Pylos. However, the prominence of plural forms, even at the expense of other case-forms, is noticeable in both instances, and this has a further parallel in the spelling conventions governing the representation of *-i* diphthongs. Although in word-medial position *-a-i-* may represent either /-ai-/ or /-ahi-/ (that is,

³³ *di-pte-ra*₃ /dip^ht^herai/ ‘hides’ (PY Ub 1315.1); *ku-te-ra*₃ /Kut^herrai/ ‘women from Kythera’? (Ab 506, 562); *o-ka-ra*₃, obscure masculine appellative (An 519.4, 654.18, 657.4, Cn 3.3); *pi-je-ra*₃ /p^hi(y)elai/ ‘pots’ (Ta 709.1); *ze-pu*₂-*ra*₃ /Zep^hurrai/ ‘women from Zephyria = Halicarnassos’? (Aa 61).

³⁴ *ke-sa-da-ra*, probably /Kessandrāi/, is the recipient of rations on PY Fg 828, Hand 1 (cf. *ku-te-ra*₃ Aa 506, *o-ka-ra*₃ An 519.14, 654.18, 657.4) and Fg 368, Hand 21 (cf. *ku-te-ra*₃, Ab 562); she probably also appears on An 435.2, Hand 1 (the text reads *ke[-]s^ha-da-ra*) as the supervisor to whom *a-ko-so-ta* /Alksoitās/ is assigning a workforce (Nakassis 2012, 279–281). *au-to*-*34-*ta-ra* is a recipient on Fn 187.10, Hand 2 (cf. *pi-je-ra*₃, Ta 709.1). Since the *a*-stem dative and nominative singular are graphically identical, it cannot be ruled out that the first two examples are nominatives of rubric; however, on Fn 187, all the recipients whose case is identifiable are in the dative, so this is the most plausible case for *au-to*-*34-*ta-ra*, while the syntax of the heading of An 435 (which begins]*o-da-sa-to*, *a-ko-so-ta*], /hō da(s)sato Alksoitās/ ‘thus Alksoitās distributed’, requires a dative case for the recipient of the distribution.

³⁵ Cf. the suggestion of Jiménez Delgado (2008, 85), that the lack of alternations in the spelling of the *o*-stem genitive singular ending *-o-jo* could be due to the scribes’ deliberate systematisation of the representation of such endings.

³⁶ Melena (2014, 74) argues that the high frequency of *a*₂’s appearances word-initially or at compound boundaries indicates that it may originally have had a ‘demarcative’ function restricted to these positions, and subsequently acquired the value of /ha/ due to the higher frequency of /a/ compared to the other Greek vowels. However, this sign actually appears in these positions much less frequently than the signs for diphthongs (c.25% of occurrences, compared to 100% of certain occurrences of both *a*₃ and *au*). The suggestion of Pierini (2014, 131–135) that this sign originally denoted */s/ plus a short vowel and, after the merger of intervocalic */s/ and */y/ > /h/, came to represent the outcome of the latter as well, does not explain what the origin of such a sign would have been, nor why it should have undergone the change of */s/ > /h/ while the *s*-series did not.

³⁷ PY Ng 332.1 and Wa 114.2; this is also spelt *pe-ra-ko-ra-i-ja* (Pa 398.a), and the corresponding ethnic adjective as *pe-ra-a-ko-ra-i-jo* (On 300.8).

either a diphthong or a hiatus between vowels),³⁸ final *-a-i* is restricted to sequences of the latter type, with final */-ai/* being represented by *-a* only; the same applies to final *-e/-e-i* (*/-ei, -ehi/*) and *-o/-o-i* (*/-oi, -o(i)hi/*). The practical outcome of this concerning, for instance, the *a*-stem declension is that the dative singular */-āi/* and nominative plural */-ai/* are each spelt only as *-a* (as, for that matter, are the nominative, accusative, and feminine genitive singular and accusative plural), while the dative plural */-a(i)hi/*, spelt *-a-i*, is one of the few graphically distinct case-forms in the whole declension. As in the case of *ra*₃, there is no linguistic or orthographic reason why both */-ai/* and */-a(i)hi/* should not be spelt *-a-i*; rather, it seems a deliberate convention to enable the distinction of at least one of these cases, namely the dative plural.

What emerges from these three examples, then, is a balancing act between two opposing concerns: one for accuracy and clarity in the distinction of certain linguistic forms, the other to avoid the complications that would arise from any major structural changes to the script. It should also be noted that the choice to distinguish particular forms appears not to be aimed at accurate linguistic representation *per se*, whether phonemic or morphological, but rather to maximise the distinctiveness of categories considered particularly important by the scribes. As we have already seen, there is in principle no reason why *ra*₃ should not be used for dative singulars, nor is the use of *a*₂ to mark neuter plurals strictly necessary according to the conventions of the script; and the usage of the spellings *-a* and *-a-i* are not compatible with a principal goal of either linguistic accuracy or orthographic consistency. The apparent focus of *a*₂ and *ra*₃ on plural forms can, perhaps, be ascribed to the practical needs of the Linear B administrative documents. As is amply demonstrated by the frequency of nominatives of rubric in the Linear B texts, distinguishing the case of a particular entry is not always of the greatest importance – whether a certain person is the donor or recipient of the listed items, for instance, could generally be worked out from context, whether specified in the text or simply known by the scribe – whereas ambiguity in the number of people or items recorded is potentially both less easy to resolve from context and more likely to lead to problematic accounting errors. In the case of spellings in *-a-i*, the fact that the dative plural is the single case-form distinguished is not necessarily significant, since once the choice has been made to restrict the use of this spelling, this is the only way to ensure the distinctiveness of at least one case-form. However, the point is that here, as in the use of *a*₂ and *ra*₃, we can see what appears to be a deliberate adaptation of the writing system – here understood in a broad sense as including spelling rules and conventions as well as the syllabary itself – for the purpose of making clear distinctions in areas of particular importance within the context of the Linear B documents. There would have been no special need to

³⁸ E.g. *pa-i-to* /*Phaistos*/; *o-pi-ra-i-ja* (also a place-name) probably /*Opilāhiā*/, from **/lāh-/* ‘stone’ ~ *lāας*.

ensure that the spelling *-a-i* was restricted to dative plurals had these not been a frequently-occurring category in the records.

Grammatical or morphological usefulness is, naturally, neither confined solely to motivating the creation of new Linear B signs, nor the only possible motivating factor for such creations. *ra*₂ 𐀢, for instance, has clear correspondences in AB76 𐀢 𐀣 and 069 𐀢, but its usefulness in representing the relatively common Mycenaean Greek *a*-stem nominal and adjectival ending */-r-ia/* may well have been an important factor in its being retained and used in Linear B;³⁹ cf. the parallel sign *ro*₂ 𐀢, whose ability to represent the *o*-stem equivalent */-r-ios/* may well have contributed to its use, whether this sign was a Linear B creation or a continuation of a (currently unattested) Linear A sign (see p.●●).⁴⁰ *a*₃ 𐀢, on the other hand, is probably a Linear B creation,⁴¹ but since it is used only in word-initial position clearly cannot have a morphological function. Instead, its primary usefulness is in enabling the unambiguous representation of initial */ai-/*, which may be lexically important, enabling distinction of otherwise homographic names or words; the pre-existence of *au*, inherited from Linear A, may well have also been a strong motivating or enabling factor in creating a parallel sign for */ai/*.

Even a single sign can show a mixture of possible different motivations, any or all of which may have contributed to its original creation and subsequent continued use – a point which is well-illustrated by the group of labialised signs. *twe* and *dwe* both appear solely or primarily in adjectives containing the highly productive Mycenaean suffix */-went-/*: *twe* in *o-da-twe-ta* and *dwe* in *te-mi-dwe*.⁴² *dwo* similarly appears in two terms which probably contain the equally productive suffix


³⁹ c.25-30% of *ra*₂'s attestations are in appellatives referring to female work-groups, such as *me-re-ti-ra*₂ **/meletria/ > /meletirrai/* 'flour-grinders' (on the phonetic interpretation of such terms, see Lejeune 1997b, 211-212); these are found throughout the PY Aa-, Ab-, and Ad-series and on TH Of 36.1.2.

⁴⁰ c.30% of *ro*₂'s attestations are in nouns such as *tu-ro*₂ **/turyos/ > /turros/* 'cheese' (and the monogram *TU+RO*₂: PY Un-series), *qe-ro*₂ */sk^wellos/* 'armband'? (KN K(1) 740.3.6, Sk-series), and *ku-pa-ro*₂ **/kuparyos/ > /kuparros/* 'cyperus' (PY Un-series), as well as the adjective *po-pu-ro*₂ **/porphuryō/ > /porphurrō/* 'purple' (feminine nominative dual: KN L 758.a); it is also frequent in masculine personal names in **/-r-ios/* or **/-r-iōn/*, e.g. *u-ro*₂ */Hullos/ < */Hulyos/?* (KN Db 5367).

⁴¹ Palaima (2003) identifies a sign on a cauldron from Mycenae (Karo 1930-1933 no.576, pl. CLIX lower right; classed as 'MY Zf 2' in Younger [Linear A website, section 'Other Texts']) as a Linear A antecedent to *a*₃, (A)B43. While morphologically this sign does appear closer to *a*₃ than any other Linear A or B sign, other identifications are still possible – for example, Linear B *i* 𐀢 or *no* 𐀢, cf. AB28 𐀢 and Cretan Hieroglyphic 008 𐀢 (Grumach 1962; Packard 1974, 110) – and the identification of this sign with A306 𐀢 and the suggestion that this may have the value *A*₂ or *AI* (Packard 1974, 108-109; Younger [Linear A website, section 'Introduction: Language']) are both highly doubtful. More importantly, the sign's context – an isolated sign on a vessel – makes its function as an inscription and its relationship to any existing writing systems questionable. I therefore do not regard *a*₃ as currently having a secure Linear A correspondence.

⁴² See pp.●●.




/-wos-/ (> /-woh-/ before a vowel): *e-re-dwo-e*, plausibly a masculine nominative plural perfect participle in /-woh-es/, though the verb represented by *e-re-d-* is uncertain;⁴³ and *wi-dwo-i-jo*, a personal name, probably /Widwohios/ < */Wid-wos-ios/, based on the perfect participle of the root */wid-/ ‘see’ (PY Ep 539.12; TH Uq 434.13).⁴⁴ This morphological importance – representing heteromorphemic sequences in which a root ending in a dental is followed by one of these highly productive suffixes – seems, however, unlikely to have been the primary motivation behind the creation of these signs (as is argued by Palaima and Sikkenga [1999, 605]), though it may have contributed to their continued use in some cases.⁴⁵ *o-da-twe-ta* and *te-mi-dwe* are both repeated frequently by particular scribes throughout the same series of tablets recording chariot wheels (KN So-series, Hands 130 and 131; PY Sa-series, Hand 26): as suggested above in the case of *two* (p.●●), a desire to represent these key repeated terms more efficiently may well have been the original motivation (and the prior invention of one could then have influenced the subsequent creation of the other). *dwo*, on the other hand, appears three times on its own representing the numeral ‘two’ /dwo/ (PY Eb 338.B, Eo 278, Ub 1315.3b) – the only instance in Linear B of a single sign being used to write a word, which the Mycenaean scribes seem generally to have avoided (Melena 2014, 125) – as well as in the related name *dwo-jo* /Dwoios/ (literally ‘double’: KN V(3) 492.1, X 8126) and a second (unrelated) name *ma-si-dwo* (KN Fh 360.b). Given that the sign *dwo* itself was apparently created on the basis of the word /dwo/, the possibility of using this to represent the numeral may well have been a strong motivation for this creation; its morphological usefulness in representing the /-wos-/ suffix was perhaps a contributing factor to its wider use, but still secondary to a concern for efficient lexical representation similar to that seen in the cases of *dwe* and *twe*.

Finally, the sign *pte*  remains to be examined. This sign (which has no known Linear A or Cretan Hieroglyphic equivalent),⁴⁶ is unusual even amongst the extra signs in representing a sequence of two stops, rather than a stop plus a glide. It is generally assumed (following Lejeune 1997b, 204-205), that its original value would have been */pye/, making it in origin one of the palatalised signs; this value would have become *pte* by the regular Greek sound change of */py/ >

⁴³ A possible interpretation would be /ēreidwohes/, meaning ‘set to work’ (Melena 2014, 60), cf. ἐρείδω (*LSJ* q.v. II.2); this is plausible from context, since *e-re-dwo-e* appears in the headings of two personnel tablets (KN As(1) 604.1, V(3) 655.1).

⁴⁴ This is also spelt *wi-do-wo-i-jo* (PY Ae 344, An 5.2) and *wi-du-wo-i-jo* (PY Jn 415.3).

⁴⁵ Although *twe* is found only in the KN So-series, *dwe* and *dwo* are more widely attested. *dwe* also appears in a possible personal name]*mi-dwe* (KN As 5605.2); a personal name or adjective]*mi-dwe* (KN Ga(1) 680 lat.inf.); and the obscure term *a-dwe-e* (TH Wu 99.β). On *dwo*, see below.

⁴⁶ Two Cretan Hieroglyphic signs, 034  and 036 , bear some resemblance to *pte*, but neither is close enough to make identification more than a slight possibility; neither is given as a correspondence to this sign by either *CHIC* or Younger (Cretan Hieroglyphic website, section ‘Notes on the Signs’). Younger tentatively suggests 022  as a possible correspondence; since this sign is a hapax identified as an ideogram and requires turning through 180° to resemble *pte* even slightly, I do not find this a convincing suggestion.

/pt/ (the results of which are seen in Classical Greek in, e.g., verbs such as κλέπτω ‘steal’ < */klep-yō/: Lejeune 1972b, 79). Although this hypothesis makes *pte* fit in with the apparent structure of the Linear B script according to the evidence of the other extra signs, it does not take account of the actual contexts in which the sign is attested. A remarkably high proportion of these consists of Greek vocabulary items, which account for at least 54% of lexemes in which *pte* appears and over 90% of its total attestations; moreover, this includes some terms which incorporate the highly productive agent suffix /-tēr/.⁴⁷ Considering that the majority of the Linear B corpus as a whole consists of personal names and place names,⁴⁸ not to mention terms of non-Greek or obscure origin, *pte*’s extremely low proportion of attestations in such terms is highly noticeable.⁴⁹ (For comparison, of the certain attestations of *a*₂, whose use is strongly motivated by Greek phonological and morphological factors, only c.50% are in Greek vocabulary words, and even this is a relatively high proportion in the context of the Linear B corpus.) Moreover, in *none* of these Greek terms does the /-pt-/ sequence originate from */py/. This is not in itself problematic, since on the completion of the */py/ > /pt/ sound-change a sign **pye* > *pte* could come to be used for any instance of /pte/ regardless of its origin (as remarked by Lejeune [1997b, 205]); however, unless we assume that the absence of any known correspondences to *pte* in the other Cretan scripts is due to chance (which, of course, remains a possibility), the question arises of what the reason(s) might have been for the invention of this sign within Linear B. In fact, why a sign **pye* should have been invented is highly unclear. **pya* and **pyo*, if they existed,⁵⁰ could in principle have been used in similar contexts to *ra*₂ and *ro*₂ (pp.●●), but this would not apply to **pye*. Palaima and Sikkenga (1999, 605) argue that this could have been useful in representing linguistic categories such as verbal forms – as seen above, verbs are the main category in Classical Greek where /pt/ < */py/ appears, so that the second or third person of such verbs would be the main context in which the sequence */-pye-/ might potentially occur (e.g.

⁴⁷ Terms including /-tēr/: *ra-pte(-re)* /raptēr(es)/ ‘leather worker(s)/saddler(s)’ (PY An- and Ea-series; KN Fh 1056, V(2) 159.5), *ra-pte-ri-ja* /raptēriai/, feminine plural adjective formed from *ra-pte* (PY Ub 1315.2). Other terms: *di-pte-ra*₍₃₎ /dip^htēra(i)/ ‘hide(s)’ (PY Ub-series; TI Uh 12.2), *DI-PTE* ‘hide(s)’ monogram (KN U 8210.2, X 9740), *di-pte-ra-po-ro* /dip^htērap^horos/ or /dip^htērapōlos/ ‘carrier/seller of hides’ (PY Fn 50.6, Un 219.6); *pte-no* /pternō/ ‘footrest?’ of a chariot (KN Sd-series); *pte-re-wa* /ptelewās/ ‘elm’, genitive (KN Se- and So-series); *tu-ru-pte-ri-ja* /strup^htēriās/ ‘alum’, genitive (PY An 35.5, Un 443.1; TI X 6.b).

⁴⁸ According to the figures given by Bartoněk (2003, 400), 73% of lexemes in the Linear B corpus are onomastic in nature (including names of people, places, gods, animals, and months, as well as patronymic and ethnic adjectives); thus, only 27% are vocabulary terms.

⁴⁹ *pte* appears in no more than six proper nouns or uninterpretable words (accounting for up to 46% of lexemes containing this sign, and c.7-9% of its total attestations). These include two personal names – *ka-pte*, possibly /Skaptēr/, cf. σκαπτήρ ‘digger’ (KN Df 1230.B) and *ptē-jo-ko* (PY An 39 v.8) – and four incomplete terms:]-*pte-si*, probably a dative plural noun, perhaps *ra]-pte-si* (KN Fh 5432);]*pte-we*, nominative plural noun or dative singular noun/personal name (PY La 623); *pte*[, unknown (KN X 7995), and]*pu-ptē*[, unknown (PRI Z 1: see Sacconi and Cultraro 2015).

⁵⁰ Melena (2014, 70) suggests that a sign *pta* (< **pya*) may have been inherited from Linear A and acted as a catalyst for the invention of *pte*; this cannot be ruled out, but note that there is no known case of a Linear B complex sign in -e being invented on the basis of a Linear A sign in -a.

κλέπτεις, -ει ‘you steal, he/she steals’ < */klep-ye-/). In the context of the Linear B records, however, in which verbal forms of *any* sort are extremely rare, it is difficult to see this as providing a strong motivation for the creation of a new sign within the writing system: why should a scribe (or scribes) invent a sign whose primary use would be in writing a category of words which, although frequent in spoken language, would hardly ever actually be used in the written records?⁵¹ On the other hand, the potential motivation for inventing a sign *pte* seems clear: it is useful in enabling the more efficient writing of various important terms, several of which are frequently repeated by certain scribes throughout particular series of tablets (*pte-no*, three-four times in Knossos Hand 128’s Sd-series;⁵² *pte-re-wa*, up to 16 times in the Knossos Se- and So-series of Hands 127, 128?, 130, and 131;⁵³ *ra-pte(-re)*, 18 times in Pylos personnel and landholding tablets;⁵⁴ *di-pte-ra*₍₃₎, probably nine times on two Pylos Ub-series tablets)⁵⁵. The status of *pte* thus seems closely comparable to that of *dwe* and *twe*, which (as discussed above: p.●●), are found repeatedly in the terms *te-mi-dwe* and *o-da-twe-ta*; the parallel is made even closer by the fact that, just as *te-mi-dwe* and *o-da-twe-ta* incorporate an important morphological formation (the adjectival suffix /-went-/), so too does *ra-pte(-re)* (the agent suffix /-tēr/). I suggest, therefore, that it may not be necessary to reconstruct a process by which an original **pye* became *pte*, but that the sign may in fact have been created as *pte*.⁵⁶ Clearly, it remains a possibility that a Linear A antecedent of *pte* did exist, and that future discoveries could necessitate a revision of this argument; but in any case, what I aim to stress is not so much the details relating to *pte* or to any other individual sign, but, as in the first part of this paper, the methodological points they raise – namely the importance of considering the circumstances of use of individual signs, rather than simply drawing conclusions on the basis of what we perceive to be the structure or ‘system’ of Linear B (or Linear A, or any other script) as a whole.

⁵¹ F. Aurora has pointed out to me that if Linear B was also used to write texts on perishable materials, these could have included a wider range of linguistic categories than the tablets. However, as Bennet (2001, 27-30) has shown, longer-term records on other media appear to be neither required by the Mycenaean administrative system nor suggested by the evidence of the clay tablets themselves.

⁵² KN Sd [[4401]], 4402.a, 4405.a, 4450.b.

⁵³ KN Se 879.b, [890], 891.B, 892, 893, 5729, [7920] (Hand 127), [9307] (-); So(1) 4429.b, 4437, 4440.b, 4448, 4449 (Hand 130); So(2) 4445 (Hand 131), 4431 (Hand 131?). So 4435.A (Hand 128?) reads *pte-re-e*[-], perhaps a mistake for *pte-re-wa* (DMic).

⁵⁴ An 172.1 (Hand 1); An 298.1.2, 424.1.2.2 (Hand 3); An 207.14-.18, Ea 28, 29, [56.a], 325, 460.a, 754.a, 813 (Hand 43).

⁵⁵ Ub 1315.1 (Hand 31), 1318.1.1.1.2.3.4.7 (Hand 32).

⁵⁶ I am aware of two previous arguments for *pte* being the original value of this sign. Ruijgh (1967, 53, n.35) suggests that *pte* originally denoted a Minoan phoneme /pʰ/, traces of which survive in doublets such as πτόλεμος/πόλεμος and πτόλις/πόλις; however, even aside from *pte*’s apparent absence from Linear A and its infrequent use in words of non-Greek origin, the fact that both πτόλεμος/πόλεμος and πτόλις/πόλις have probable Indo-European etymologies (CDE s.v. πτ-) means there is no evidence to support this. The argument of Neumann (1996, 96-98) is based on an acrophonic derivation from πτέρυξ ‘bird’ or πτερόν ‘wing’, with the sign representing a bird’s wings; I regard this as neither a plausible explanation for the shape of *pte* nor a secure basis on which to reconstruct its original value.

Conclusions

Just as discussions of the creation of Linear B tend to focus (quite naturally) on the single point of its adaptation from Linear A, discussions of the extra signs tend to focus on their potential to act as evidence for the structure and values of the Linear A script and the phonology of the Minoan language. The first part of this paper demonstrated that their use in this way is much less well-founded than is normally assumed, and that the palaeographic evidence is insufficient to support the systematic reconstruction of Minoan phonology for which it has often been used. However, as the second part of this paper has shown, a detailed analysis of the extra signs can give a very different view of the processes by which Linear B was created. Rather than focusing on the single point of its adaptation from Linear A, the process of creation can be seen as an ongoing one, involving a period of significant further development after this initial point;⁵⁷ rather than viewing apparently anomalous features of Linear B as symptomatic of a ‘failure’ to adapt Linear A to a Greek context, the process can be seen as a less passive and more creative one on the part of the adaptors and subsequent users of Linear B. A complex set of possible motivations has been identified for their creation and use of new signs, whether relating to phonemic and/or morphological representation, efficiency in writing, or a combination of these factors; but, crucially, these are generally rooted in the practical needs of the Mycenaean scribes in writing administrative documents. It is these kinds of potential motivations within the context of a writing system’s use, and the possible interplay between them, which need to be taken into account in any analysis of processes of script development and the relationships between scripts.

Bibliography

- CDE* Chantraine, P. (1968) *Dictionnaire étymologique de la langue grecque: Histoire des Mots*. Paris, Éditions Klincksieck.
- CHIC* Olivier, J.-P., and Godart, L. (1995) *Corpus Hieroglyphicarum Inscriptionum Cretae. École Française d’Athènes: Études crétoises 31*. Paris, de Boccard.
- COMIK* Chadwick, J. *et al.* (1986-1998) *Corpus of Mycenaean Inscriptions from Knossos, vol.1-4. Istituto per gli Studi Micenei ed Egeo-Anatolici: Incunabula Graeca LXXXVIII*. Cambridge/Roma, Cambridge University Press/Edizioni dell’Ateneo.
- DMic* Aura Jorro, F. (1985-1993) *Diccionario micénico, vol.I-II. Diccionario griego-español*. Madrid, Instituto de Filología.
- Docs*² Ventris, M.G.F., and Chadwick, J. (1973) *Documents in Mycenaean Greek*, 2nd edition. Cambridge, Cambridge University Press.

⁵⁷ Cf. Palaima (1988, 341), who argues for a gradual development process post-adaptation of various aspects of the writing system such as the creation of additional ideograms, text formatting, etc.

- GORILA Godart, L., and Olivier, J.-P. (1976) *Recueil des inscriptions en linéaire A. École Française d'Athènes: Études crétoises 21*. Paris, P. Geuthner.
- LSJ Liddell, H.G. et al. (1996) *A Greek-English Lexicon*, 9th edition, with a revised supplement. Oxford, Clarendon Press.
- Aravantinos, V.L., and Vasilogamvrou, A. (2012) 'The first Linear B documents from Ayios Vasileios (Laconia)' in Carlier, P. et al. (eds) *Études mycéniennes 2010. Actes du XIIIe colloque international sur les textes mycéniens et égéens. Paris 20-23 septembre 2010. Biblioteca di "Pasiphae" X*, Pisa/Roma (Fabrizio Serra), 41-54.
- Bartoněk, A. (2003) *Handbuch des mykenischen Griechisch. Indogermanische Bibliothek. Erste Reihe*. Heidelberg, Winter.
- Beekes, R.S.P. (2014) *Pre Greek: Phonology, Morphology, Lexicon (edited by S. Norbruis). Brill Introductions to Indo-European Languages 2*. Leiden/Boston, Brill.
- Bennet, J. (2001) 'Agency and bureaucracy: thoughts on the nature and extent of administration in Bronze Age Pylos' in Voutsaki, S. and Killen, J.T. (eds) *Economy and Politics in the Mycenaean Palace States: Proceedings of a Conference Held on 1-3 July 1999 in the Faculty of Classics, Cambridge. Cambridge Philological Society. Supplementary volume 27*, Cambridge (Cambridge Philological Society), 25-37.
- Chadwick, J. (1968) 'The group sw in Mycenaean', *Minos* 9, 62-65.
- Consani, C. (1996) 'AB 118/DWO tra minoico e miceneo' in Consani, C., Negri, M. and Aspesi, F. (eds) *Κρήτη τις γὰρ ἔστι: studi e ricerche intorno ai testi minoici. Quaderni linguistici e filologici, Università di Macerata, Facoltà di lettere e filosofia, Istituto di glottologia e linguistica generale VIII*, Roma (Editrice 'il Calamo'), 71-81.
- Davis, B. (2014) *Minoan Stone Vessels with Linear A Inscriptions. Aegaeum 36*. Leuven/Liège, Peeters.
- Driessen, J. (1990) *An Early Destruction in the Mycenaean Palace at Knossos: a New Interpretation of the Excavation Field-Notes of the South-East Area of the West Wing. Acta archaeologica Lovaniensia. Monographiae 2*. Leuven, Katholieke Universiteit Leuven.
- Driessen, J. (2000) *The Scribes of the Room of the Chariot Tablets. Suplementos a Minos 15*. Salamanca, Universidad de Salamanca.
- Duhoux, Y. (1978) 'Une analyse linguistique du linéaire A' in Duhoux, Y. (ed.) *Études minoennes I. Le linéaire A. Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain 14*, Louvain-la-Neuve (Peeters), 65-129.
- Duhoux, Y. (1989) 'Le linéaire A: problèmes de déchiffrement' in Duhoux, Y., Palaima, T.G. and Bennet, J. (eds) *Problems in Decipherment. Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain 49*, Louvain-la-Neuve (Peeters), 59-120.
- Duhoux, Y. (1998) 'Pre-hellenic language(s) of Crete', *The Journal of Indo-European Studies* 26, 1-39.
- Duhoux, Y. (2008) 'Mycenaean anthology' in Duhoux, Y. and Morpurgo Davies, A. (eds) *A Companion to Linear B: Mycenaean Greek Texts and their World, vol. I. Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain 120*, Louvain-la-Neuve (Peeters), 243-393.
- Grumach, E. (1962) 'Mitteilungen: Linear A auf dem Festland', *Kadmos* 1:1, 85-86.

- Heubeck, A. (1979) 'Remarks on the sign-doublets *ro*₂, *ra*₂, *ta*₂' in Risch, E. and Mühlestein, H. (eds) *Colloquium Mycenaean. Actes du sixième colloque international sur les textes mycéniens et égéens tenu à Chaumont-sur-Neuchâtel du 7 au 13 septembre 1975*, Neuchâtel-Genève (Université de Neuchâtel/Droz), 239-258.
- Jiménez Delgado, J.M. (2008) 'La situación de *h en griego micénico', *Kadmos* 47:1-2, 73-90.
- Karo, G. (1930-1933) *Die Schachtgräber von Mykenai*. München, F. Bruckmann.
- Lejeune, M. (1958a) 'Coup d'oeil sur le système graphique' in Lejeune, M. (ed.) *Mémoires de philologie mycénienne. Première série (1955-1957)*, Paris (Centre national de la recherche scientifique), 318-330.
- Lejeune, M. (1958b) 'Sur les signes notant des syllabes à groupe consonantique initial' in Lejeune, M. (ed.) *Mémoires de philologie mycénienne. Première série (1955-1957)*, Paris (Centre national de la recherche scientifique), 255-282.
- Lejeune, M. (1972a) 'Doublets et complexes' in Lejeune, M. (ed.) *Mémoires de philologie mycénienne. Troisième série (1964-1968)*. Istituto per gli studi micenei ed egeo-anatolici: *Incunabula Graeca XLIII*, Roma (Edizioni dell'Ateneo), 89-104.
- Lejeune, M. (1972b) *Phonétique historique du mycénien et du grec ancien. Tradition de l'humanisme IX*. Paris, Éditions Klincksieck.
- Lejeune, M. (1997a) 'Les syllabogrammes B et leur translittération' in Lejeune, M. (ed.) *Mémoires de philologie mycénienne. Quatrième série (1969-1996)*. Istituto per gli studi micenei ed egeo-anatolici: *Incunabula Graeca XCIX*, Rome (Istituti editoriali e poligrafici internazionali), 25-52.
- Lejeune, M. (1997b) 'Pré-mycénien et proto-mycénien' in Lejeune, M. (ed.) *Mémoires de philologie mycénienne. Quatrième série (1969-1996)*. Istituto per gli studi micenei ed egeo-anatolici: *Incunabula Graeca XCIX*, Roma (Istituti editoriali e poligrafici internazionali), 197-212.
- Meißner, T. (2008) 'Notes on Mycenaean spelling' in Sacconi, A. et al. (eds) *Colloquium Romanum. Atti del XII colloquio internazionale di micenologia, Roma 20-25 febbraio 2006*, vol. II. *Pasiphae II*, Pisa/Roma (Fabrizio Serra), 507-521.
- Meißner, T. (2013) 'Forschungsbericht griechische Etymologie', *Kratylos* 58, 1-32.
- Meißner, T., and Steele, P.M. (forthcoming [2017]) 'Linear A and Linear B: structural and contextual concerns' in Landenius Enegren, H. and Nosch, M.-L.B. (eds) *Aegean Scripts. Proceedings of the 14th International Colloquium on Mycenaean Studies, held in Copenhagen, 2-5 September 2015*. *Incunabula Graeca*, Roma (CNR-ISMA).
- Melena, J.L. (1983) 'Notas de filología micénica III: el silabograma *86', *Emerita* 51, 262-267.
- Melena, J.L. (1987) 'On untransliterated syllabograms *56 and *22' in Ilievski, P.H. and Crepajac, L. (eds) *Tractata Mycenaean. Proceedings of the Eighth International Colloquium on Mycenaean Studies, held in Ohrid, 15-20 September 1985*, Skopje (Macedonian Academy of Sciences and Arts), 203-232.
- Melena, J.L. (2014) 'Mycenaean writing' in Duhoux, Y. and Morpurgo Davies, A. (eds) *A Companion to Linear B: Mycenaean Greek Texts and their World*, vol. III. *Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain 133*, Louvain-la-Neuve (Peeters), 1-186.
- Melena, J.L. (forthcoming) 'On the structure of the Mycenaean Linear B syllabary. I. The untransliterated syllabograms. Preliminary report' in *Proceedings of the 11th International*

Colloquium on Mycenaean Studies, Austin, Texas, 7th-12th May 2000, Austin.
[\[www.academia.edu/2203598/\]](http://www.academia.edu/2203598/)

- Morpurgo Davies, A. (1985) 'Mycenaean and Greek Language' in Morpurgo Davies, A. and Duhoux, Y. (eds) *Linear B: a 1984 survey. Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain* 26, Louvain-la-Neuve (Cabay), 75-126.
- Muhly, P., and Olivier, J.-P. (2008) 'Linear A inscriptions from the Syme sanctuary, Crete', *Αρχαιολογική Εφημερίς*, 197-223.
- Nakassis, D. (2012) 'Labor mobilization in Mycenaean Pylos' in Carlier, P. et al. (eds) *Études mycéniennes 2010: actes du XIIIe colloque international sur les textes égéens: Sèvres, Paris, Nanterre, 20-23 septembre 2010. Biblioteca di "Pasiphae" X*, Pisa/Roma (Fabrizio Serra), 269-283.
- Nakassis, D. (2013) *Individuals and Society in Mycenaean Pylos. Mnemosyne Supplements. History and Archaeology of Classical Antiquity* 358. Leiden/Boston, Brill.
- Neumann, G. (1996) 'Zur Schaffung der Zeichen *91 two und *62 pte von Linear B' in de Miro, E., Godart, L. and Sacconi, A. (eds) *Atti e memorie del secondo congresso internazionale di micenologia. Roma-Napoli, 14-20 ottobre 1991, vol. I: Filologia. Incunabula Graeca XCVIII*, Roma (Gruppo editoriale internazionale), 91-99.
- Olivier, J.-P. (1997) 'The possible methods in deciphering the pictographic Cretan script' in Duhoux, Y., Palaima, T.G. and Bennett, J. (eds) *Problems in Decipherment. Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain* 49, Louvain-la-Neuve (Peeters), 39-58.
- Packard, D.W. (1974) *Minoan Linear A*. Berkeley/Los Angeles/London, University of California Press.
- Palaima, T.G. (1988) 'Development of the Mycenaean writing system' in Bennett, E.L., Olivier, J.-P. and Palaima, T.G. (eds) *Texts, Tablets and Scribes: Studies in Mycenaean Epigraphy and Economy offered to Emmett L. Bennett Jr. Suplementos a Minos* 10, Salamanca (Universidad de Salamanca), 269-342.
- Palaima, T.G. (2003) 'The inscribed bronze 'kessel' from Shaft Grave IV and Cretan heirlooms of the bronze artist named 'Aigeus' vel sim. in the Mycenaean palatial period' in Duhoux, Y. (ed.) *Bricciaka. A Tribute to W.C. Brice. Cretan Studies* 9, Amsterdam (Adolf M. Hakkert), 188-201.
- Palaima, T.G., and Sikkenga, E. (1999) 'Linear A > Linear B' in Betancourt, P.P. et al. (eds) *Meletemata. Studies in Aegean Archaeology Presented to Malcolm H. Wiener as He Enters His 65th Year, vol. II. Aegaeum* 20, Liège/Austin (Histoire de l'art et archéologie de la Grèce antique; Program in Aegean Scripts and Prehistory), 599-608.
- Palmer, L.R. (1955) 'Observations on the Linear 'B' tablets from Mycenae', *Bulletin of the Institute of Classical Studies* 2, 36-45.
- Palmer, L.R. (1963) *The Interpretation of Mycenaean Greek Texts*. Oxford, Oxford University Press.
- Petrusevski, P. (1979) 'Révision de la transcription des syllabogrammes *17 (za), *20 (zo), *74 (ze) et *79 (zu?)' in Risch, E. and Mühlestein, H. (eds) *Colloquium Mycenaicum. Actes du sixième colloque international sur les textes mycéniens et égéens tenu à Chaumont-sur-Neuchâtel du 7 au 13 septembre 1975*, Neuchâtel-Genève (Université de Neuchâtel/Droz), 259-266.
- Pierini, R. (2014) 'Ricerche sul segno 25 del sillabario miceneo' in Bernabé, A. and Luján, E.R. (eds) *Donum Mycenologicum: Mycenaean Studies in Honour of Francisco Aura Jorro*.

Bibliothèque des Cahiers de l'Institut de Linguistique de Louvain 131, Louvain-la-Neuve/Walpole, MA (Peeters), 105-137.

- Risch, E. (1979) 'Les consonnes palatalisées dans le grec du II^e millénaire et des premiers siècles du I^{er} millénaire' in Risch, E. and Mühlestein, H. (eds) *Colloquium Mycenaeanum. Actes du sixième colloque international sur les textes mycéniens et égéens tenu à Chaumont-sur-Neuchâtel du 7 au 13 septembre 1975*, Neuchâtel-Genève (Université de Neuchâtel/Droz), 267-281.
- Ruijgh, C.J. (1967) *Études sur la grammaire et le vocabulaire du grec mycénien*. Amsterdam, Adolf M. Hakkert.
- Sacconi, A., and Cultraro, M. (2015), 'Un fragment de vase inscrit de Prinias: PRI Z 1' (Paper read at the Aegean Scripts. 14th International Colloquium on Mycenaean Studies, held in Copenhagen, 2-5 September 2015)
- Shelmerdine, C.W. (2012) 'Iklaina tablet IK X 1' in Carlier, P. et al. (eds) *Études mycéniennes 2010. Actes du XIII^e colloque international sur les textes égéens, Sèvres, Paris, Nanterre, 20-23 septembre 2010. Biblioteca di "Pasiphae" X*, Pisa/Roma (Fabrizio Serra), 75-78.
- Stephens, L., and Justeson, J.S. (1978) 'Reconstructing 'Minoan' phonology: the approach from universals of language and universals of writing systems', *Transactions of the American Philological Association* 108, 271-284.
- Thompson, R.J.E. (2005) 'Two notes on Mycenaean labial stops', *Živa Antika* 55, 107-115.
- Younger, J.G. (2003) 'Cretan Hieroglyphic transaction terms: 'total paid' and 'total owed'' in Duhoux, Y. (ed.) *Briciaka. A Tribute to W.C. Brice. Cretan Studies* 9, Amsterdam (Adolf M. Hakkert), 301-316.
- Younger, J.G. (Cretan Hieroglyphic website) The Cretan Hieroglyphic texts, <http://people.ku.edu/~jyounger/Hiero/index.html>, accessed July 2015.
- Younger, J.G. (Linear A website) Linear A texts in phonetic transcription & commentary, www.people.ku.edu/~jyounger/LinearA/, accessed July 2015.